

# ***Epigenetics and Equity: The Ultimate Public Health Challenge***

Collaborating for Health :  
Building Blocks for a Healthier Idaho

Bureau of Community and Environmental Health  
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The problem is whether we are determined to go in the direction of compassion or not . . . . If I lose my direction I have to look for the north star and I will go to the north. That does not mean I expect to arrive at the north star. I just want to go in that direction.

Thich Nhat Hanh

## *Three public health lessons*

- Social determinants of health
- Public health as social justice
  - Population focus

*“When it comes to your health, your zip code may be more important than your genetic code.”*

Robert Wood Johnson Foundation

# *The Barker Hypothesis and the Developmental Origins of Health & Disease*

Poor nutrition in the womb, as indicated by lower birth weight, leads to higher risk of heart disease and other chronic diseases such as hypertension, stroke and type 2 diabetes.

Why?

1. Reduced function in key organs
2. Altered settings in metabolism and hormonal feedback
3. Increased vulnerability to adverse environments later in life

## *Low birth weight*

- A response to low nutrient, high stress environments;
- Associated with higher risk of chronic diseases such as diabetes, heart disease, obesity, hypertension, various cancers;
- Associated with compromised cognitive function -- poorer school performance, lower test scores, higher rates of social problems, and higher risk of mental health problems;
- Low birth weight is not destiny, risk is not certainly; but it signifies vulnerability.

# *Chronic Stress*

- Chronic stress during pregnancy contributes to higher levels of cortisol that can cross into the placenta;
- Consequences include the same risks as nutritional deficiencies including significant mental health problems, heightened response to stress, poor cognitive development, etc.;
- “The elevated cortisol levels experienced by the fetus permanently adjust the setting of the stress axis of the fetus in a way that makes it more sensitive and hyper responsive to subsequent stress events.”

# *Developmental Origins of Health & Disease*

## *(First 1000 days)*

- Model for how the environment “gets under our skin” and creates biological changes that have impact over the life course;
- suggests people mostly get chronic diseases not because of the genes they inherit but because of how those genes act in response to environmental stresses;
- Basis for rethinking contributing causes and solutions for chronic diseases and social mobility;
- Potential “upstream” framework for how public health understands social and health equity;
- Urgency for community action and policy change.

# *Epigenetics*

“ ... the biochemical process through which some genes are expressed and others remain silent, and it reinforces and explains the powerful impact that the environment has on human development. Epigenetic effects occur not only through diet, chemical exposure, and high levels of environmental stress, but also through chronic poverty and racism.”

Combs-Orme, Terri. “Epigenetics and the Social Work Imperative,”  
Social Work 58:1, January 2013 (p. 23).

## *Double Hit*

- The first hit is the vulnerability created from the experience of previous generations through the first 1000 days.
- The second hit comes from hostile environments marked by racial and other discrimination, and social disadvantage that will increase the likelihood that the original vulnerability will transform into later disease or diminished social success.
- Because some of these changes can be transmitted across generations, the “second hit” of one generation can become the “first hit” of the next.

## *The upstream questions*

- What would Idaho (or any place) look like if it were the best place in the world to be pregnant and have a baby?
- What would need to change?
- What kind of policy change is needed to make this happen?
- How can the necessary political will be mobilized?
- How can that change be initiated, supported, and/or accelerated?

# *Creating a social movement*

- *Setting the agenda/creating urgency*
  - *Increasing visibility and finding initial champions*
- *Policy goals*
  - knowing what needs to be done
- *Issue framing*
  - Linking the issue to deeply held values and developing narratives
- *Political opportunity*
  - finding opportunities to implement change
- *Mobilizing resources*
  - being able to apply pressure strategically (people and funds)

## *Obstacles to progress*

- The complexity of the concepts
- Uncertainty about best starting point and balancing short term impact with real long term population change
- The well known “silo” or “cylinders of excellence” effect
- Funders resistance to focus on interstitial approaches
- Tendency to focus on personal-individual-behavioral factors rather than social-economic-policy factors
- Need for significant social change; personal behavior change is necessary but not sufficient

## *Talking Public Health*

- America's First and second language
- Systems thinking and direct cause thinking
- Equity as a cornerstone value of public health



## *Some questionable beliefs*

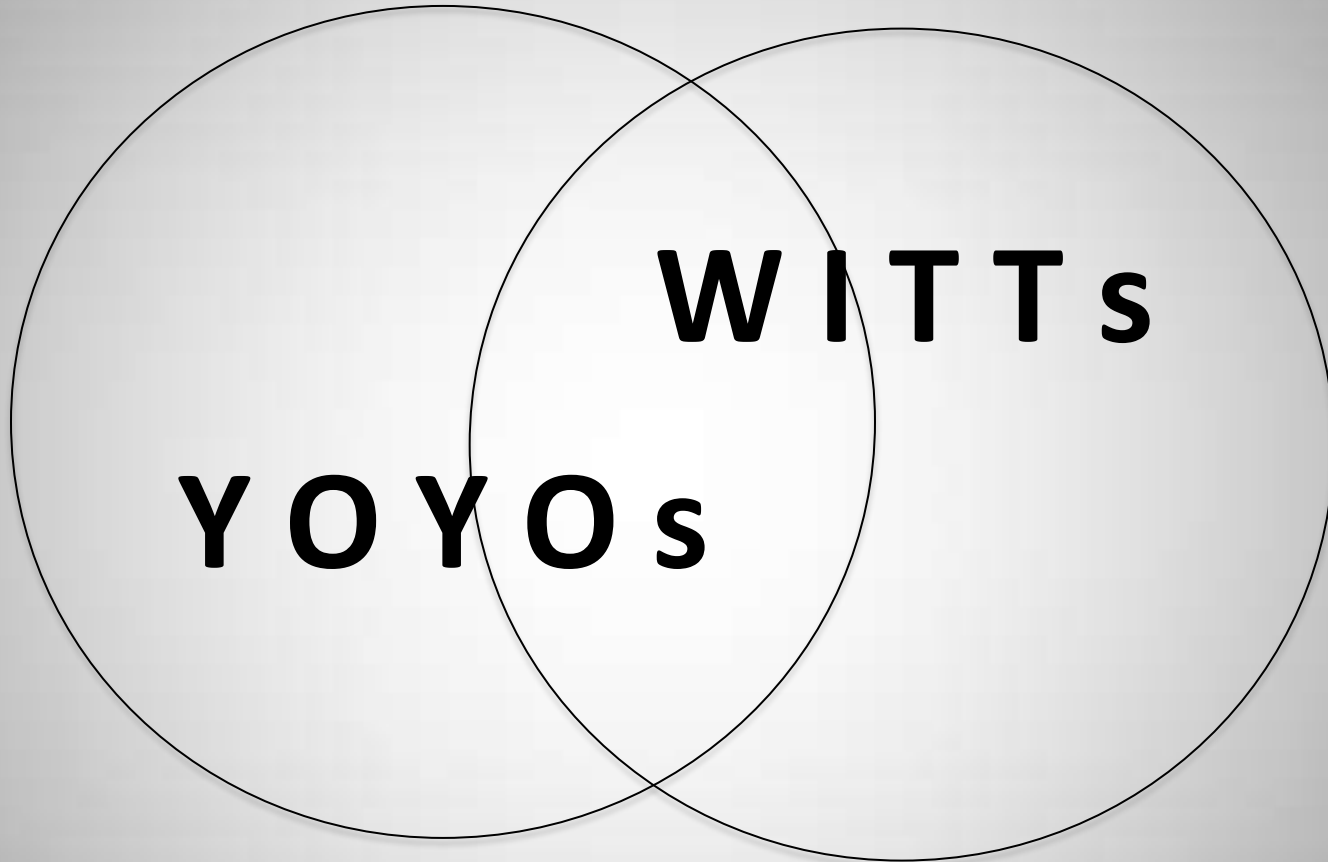
- ✓ The facts will set you free.
- ✓ The data speak for themselves.
- ✓ We need to educate everyone.
- ✓ We just need a catchier message/slogan.
- ✓ Those who don't support us don't make sense.



# OPINION



# The Odds Metaphor



Jared Bernstein, *All Together Now:  
Common Sense for a Fair Economy*

## *Frame basics*

Frames are mental structures that help people understand the world. Frames are shortcuts for people that connect abstract ideas to familiar things (and do so very, very quickly).

**EQUALITY**



# FOIJJTV



## *Frames influence how Issues are understood*

Every frame **defines the issue**, explains **who is responsible**, and suggests **potential solutions**. All of this is conveyed by images, stereotypes, or anecdotes.”

- Charlotte Ryan, *Prime Time Activism*, 1991

## *Alternative frames*

Food Safety Warnings Ignored, Girl In Critical Condition:  
Worried Friends Look On

Youth Treated for Eating Contaminated Fruit:  
Produce Recall Underway

Sickened Girl Recovers After Bad Fruit:  
“I Thought An Apple a Day Kept the Doctor Away!”

## *Framing Tension*

<b>Social Justice</b>	<b>Dominant (Market) Values</b>
<b>Shared responsibility</b>	<b>Self-determination/Self discipline/Rugged individualism</b>
<b>Interconnectedness</b>	<b>Benefits based solely on effort</b>
<b>Strong obligation to collective good</b>	<b>Limited obligation to collective good</b>
<b>Basic benefits should be assured</b>	<b>Voluntary and moral nature of behavior</b>
<b>Government involvement necessary</b>	<b>Limited government intervention</b>

# *Lakoff's three levels of analysis*

## **Level 1: Why does it matter?**

Big ideas and universal values like fairness, equality, justice, family, community

## **Level 2: What kind of problem is it?**

Issue types such as housing, education, civil rights, environment, public health

## **Level 3: What can we do about it?**

Specific issues such as tobacco taxes, cleaning up toxic waste sites, increasing access to health care coverage

Adapted from The Frameworks Institute  
<http://www.frameworksinstitute.org>

# *The importance of metaphors*

“Metaphors influence the way we reason about complex issues and forage for further information.... A metaphor (via a single word) can have a powerful influence over how people attempt to solve social problems....”

Crime as virus or Crime as beast  
Does it matter?

“Metaphors We Think With:  
The role of metaphor in reasoning,”  
(Thibodeau and Boroditsky, 2011)

## *Covert effects of metaphor*

- The metaphor provided a structured framework for understanding crime
- Persuasive effects of metaphor, however, were not recognized by subjects in either group.
- Most “influential” part of crime report was reported to be the statistics
- The metaphor had greatest power if presented early in report
- Subsequent information was chosen to confirm or elaborate original bias from the metaphor

## *Some interesting metaphors*

- Safety net or hammock
- Liquid candy or soft drink, pop
- Engine for economic development or crime train
  - Consumer watchdog or nanny state
- Good neighbor or meddling busy body
  - Brain surgery or changing a tire

# *Simplifying model*

Explaining shifting weather patterns, including arctic chill in Europe and snowstorms in the deep south:

Scientists' theories describe "...a strong pressure difference between the polar region and the middle latitudes channels the jet stream into a tight circle, or vortex, around the North Pole, effectively *containing the frigid air at the top of the world.*"



*"Its like a fence."*



## *Conclusions*

- Developmental origins is a useful framework for integrating social and health equity
- We face significant challenges in moving upstream on this issue
- Framing this issue from a social justice perspective is urgently needed
- Policy and programming must be values, as well as, science based

